chapter 7
National Security

"In the future, we envision that our transportation system will remain ready to exceed our national security requirements in three critical areas: military—to assure access and defense mobilization; economic—to ensure economic viability; and public security and safety—to exceed the citizen's expectations by maximizing security, enhancing public protection, and controlling illegal drug trafficking."

Vision of the National Security Roundtable
2025 Visioning Session, Aug. 3, 2000

"Our safety programs protect us from accidental harm; our national security programs protect us from deliberate harm."

Mortimer Downey
Deputy Secretary, U.S. Department of Transportation
Feb. 7, 2000

chapter 7
National Security

Transportation is inextricably linked to the security of our nation and its citizens. Supporting our armed forces and minimizing the transportation system's vulnerability to intentional disruption, damage, or exploitation are crucial elements of the U.S. Department of Transportation's (USDOT's) national security objective. Keeping the nation's transportation system operating efficiently to support national defense requirements and to assist in disaster response and recovery efforts, without interrupting the flow of people and goods, is expected to be a major focus over the next 25 years.

During the last quarter century, U.S. armed forces have shifted from just anticipating a possible global conflict with a dangerous and powerful adversary to being prepared for rapid deployment in localized military and humanitarian efforts as well. At the same time, the U.S. national security leadership has decided to station fewer permanent U.S. troops in foreign countries, increasing reliance on reserve forces. This new role for the military creates different demands on our transportation system.

The collapse of the Soviet Union and the Warsaw Pact transformed the world by eliminating the Soviet conventional war threat to Europe and dramatically reducing the strategic nuclear threat to the United States. However, regional instability, drug trafficking, international terrorism, information warfare, and the random use of weapons of mass destruction emerged as principal threats to our national security.

Since the end of the Cold War, many regions of the world have suffered violent intrastate or ethnic conflicts that have undermined regional stability. Pursuant to our interests and those of the international community, the United States has selectively responded to these complex emergencies with diplomatic, humanitarian, economic, and, sometimes, military responses. The chosen action reflects a careful balance of maximizing security while facilitating commerce.

"We have pursued a concerted national and international strategy against terrorism on three fronts: first, beyond our borders, by working more closely than ever with our friends and allies; second, here at home, by giving law enforcement the most powerful counterterrorism tools available; and, third, in our airports and airplanes by increasing aviation security."

President William J. Clinton
George Washington University
Aug. 5, 1996

The Department conducts a wide range of peacetime engagements with foreign democracies, in support of U.S. foreign policy, to help those nations build the security and transportation infrastuctures critical to their survival. The agencies of the Department provide support through cooperative assistance to help nations establish or improve critical infrastructure elements such as radionavigation, command and control, disaster response, maintenance, search and rescue, and law enforcement.

Homeland security is an element of national security. While the domain of national security is global, the domain of homeland security is primarily limited to our exclusive economic zone inward to the United States and its territories. Homeland security protects our homeland and citizens against an array of national security threats; it comprises three principal components—homeland defense, border protection, and sovereignty preservation.

The nation's ability to meet the security challenges of the 21st century depends heavily on the flexibility, responsiveness, and capabilities of our transportation infrastructure. To that end, the USDOT has developed the following goals:

1. reduce the vulnerability of the transportation system and its users to crime and terrorism,
2. increase the capability of the transportation system to meet the national defense needs,
3. reduce the flow of illegal drugs entering the United States,
4. reduce illegal incursions into our sovereign territory,
5. reduce the flow of illegal migrants entering the United States,
6. increase support for United States interests in promoting regional stability, and
7. reduce transportation-related dependence on foreign fuel supplies.

Force Deployment

The ability to maintain strong, capable forces throughout the world, backed by flexible, strategic, deployable forces, makes the United States a major stabilizing factor in international affairs. Transportation helps provide vital strategic mobility of materials and forces in times of national emergency.

One of the first military actions undertaken in a conflict is force deployment or "projection"—moving troops and equipment. Force projection relies on three components: sealift, airlift, and ground transportation. The importance of the key transportation role was demonstrated during Operation Desert Shield/Desert Storm (1990-1991). The United States mobilized and shipped hundreds of thousands of troops and their supporting weapons, equipment, and supplies to the Persian Gulf in a matter of months, and then returned these personnel and cargo to their home bases. The USDOT mobilized and coordinated the public and private transportation resources and systems necessary to accomplish this feat in the time required to make the operation a success [A. Strauss-Weider, Inc. 1999]. Vital, small-scale support also was needed for peacekeeping activities in Bosnia, Kosovo, Haiti, and Somalia, as well as for U.S. troops engaged in regional armed conflicts in Grenada and Panama.

The U.S. Coast Guard (USCG) facilitates the safe, efficient, and secure maritime embarkation of troops and equipment here at home. Overseas, U.S. Coast Guard Port Security Units (PSUs) support military operations worldwide by providing waterborne and limited land-based protection for shipping and critical port facilities within the waters of a port or harbor. In times of conflict, PSUs conduct operations in conjunction with Harbor Defense Commands, Mobile Inshore Undersea Warfare Units, Explosive Ordnance Disposal detachments and other U.S. or coalition rear area forces.

Sealift

The ability of the United States to respond unilaterally to military emergencies requires adequate U.S.-controlled maritime shipping capacity [USDOT MARAD 1999]. Since the end of the Cold War, increased globalization and consolidation of maritime shipping companies have reduced the number of U.S.-flagged commercial carriers. Nevertheless, nearly 80 percent of the military cargo transported during the Persian Gulf conflict was carried on U.S.-flag ships [USDOT MARAD 1998]. More than 30 percent of the cargo carried on U.S.-flag ships was transported aboard commercial vessels as a part of normal operations or under time-charter to the Department of Defense (DOD) without disruption to regular commercial service [USDOT MARAD 1998].

Table 7-1

Maritime Security Program (MSP) Participants

Participants	Vessels
American Ship Management, LLC	9 container ships
Central Gulf Lines, Inc.	3 roll-on/roll-off vessels
Crowley Maritime Corp.	3 container roll-on/roll-off vessels
Farrell Lines, Inc.	3 container ships
First American Bulk Carrier Corp.	2 container ships
First Ocean Bulk Carriers Corp., I, II, & III	3 container ships
Maersk Line, Ltd.	4 container ships
OSG Car Carriers, Inc.	1 roll-on/roll-off vessel
Sea-Land Service, Inc.	15 container ships
Waterman Steamship Corp.	4 Lighter aboard ship (LASH) (barge-carrying ship)
Total	**47 vessels**

Source: U.S. Department of Transportation, Maritime Administration, Office of Sealift Support, personal communication (Washington, DC: March 1999).

There are several programs and acts that help the United States maintain a U.S.-flag merchant fleet capable of supporting economic and national security in times of political or economic turmoil:

- The Maritime Security Program (MSP) provides annual funding for nearly 50 vessels, owned by private operators, to provide emergency sealift and related services to DOD. Table 7-1 shows the current breakdown of MSP participants.

- The Voluntary Intermodal Sealift Agreement (VISA) is an emergency preparedness pro-gram that makes commercial transportation systems available to DOD during war or other national emergencies (table 7-2).

- The National Defense Reserve Fleet (NDRF) supports DOD during national emergencies and consists of U.S. vessels strategically docked throughout the United States. The number of ships in the NDRF has declined since 1975 (figure 7-1) and today comprises 257 ships [USDOT MARAD 2000a], 90 of which are Ready Reserve Force (RRF) ships [USDOT MARAD 2000b].

- The RRF ships provide crucial sealift support during armed conflicts and humanitarian efforts, and can be tendered to the Navy's Military Sealift Command in 4, 5, 10, 20, or 30 days, depending on their location and assigned readiness priority [Hart 1999]. High-priority RRF vessels, those with four- or five-day status, are located at outport berths near military loading facilities and have civilian mainte-nance crews to assure the fastest possible

Table 7-2

Voluntary Intermodal Sealift Agreement
(Fiscal year 1999 participants)

Alaska Cargo Transport, Inc.
American Auto Carriers, Inc.
American Automar, Inc.
American President Lines, Ltd.
American Ship Management, LLC*
Central Gulf Lines, Inc.*
Crowley American Transport, Inc.*
Crowley Maritime Services
Dixie Fuels II, Ltd.
Double Eagle Marine
Farrell Lines, Inc.*
First American Bulk Carrier Corp.*
Foss Maritime Company
Lyndon
Lykes Lines Ltd., LLC
Maersk Line, Ltd.*
Matson Navigation Company, Inc.
Maybank Shipping Company, Inc.
McAllister Towing & Transportation
Moby Marine Corp.
NPR, Inc.
OSG Car Carriers, Inc.*
Osprey Shipholding Corporation, LLC
Resolve Towing & Salvage, Inc.
Sea-Land Service, Inc.
Seacor Marine International, Inc.
Sealift, Inc.
Smith Maritime
Totem Ocean Trailer Express, Inc.
Trailer Bridge, Inc.
Trico Marine Operators, Inc.
Troika International, Ltd.
Van Ommeren Shipping (USA), LLC
Waterman Steamship Corp.*
Weeks Marine, Inc.

* Denotes Maritime Security Program operators.

Source: U.S. Department of Transportation, Maritime Administration, Office of Sealift Support, personal communication (Washington, DC: March 1999).
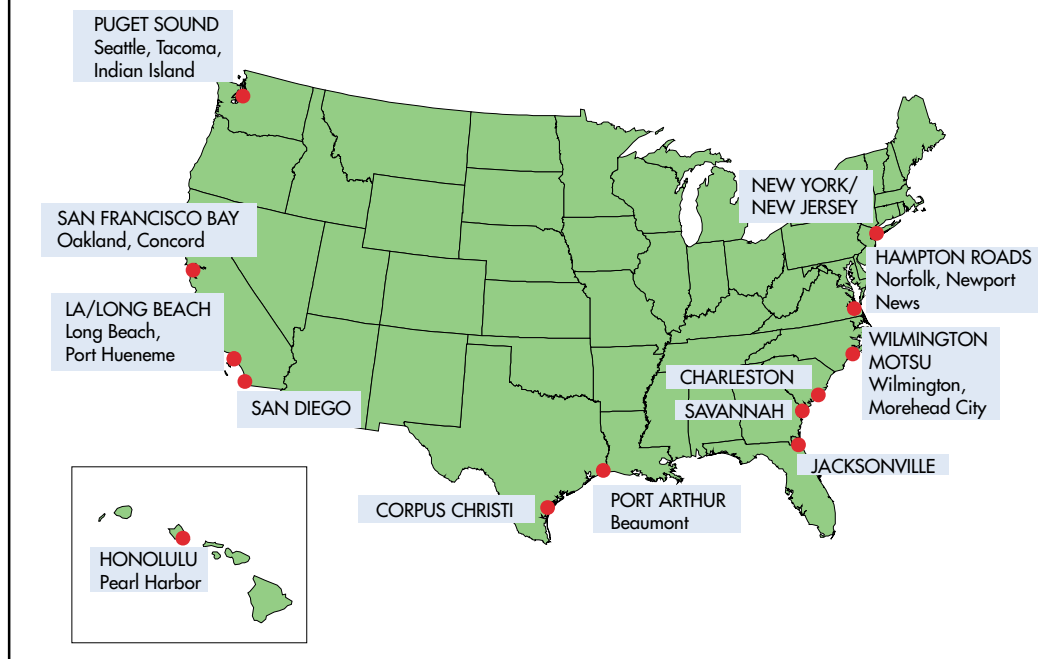
Figure 7-1

National Defense Reserve Fleet: 1975-99
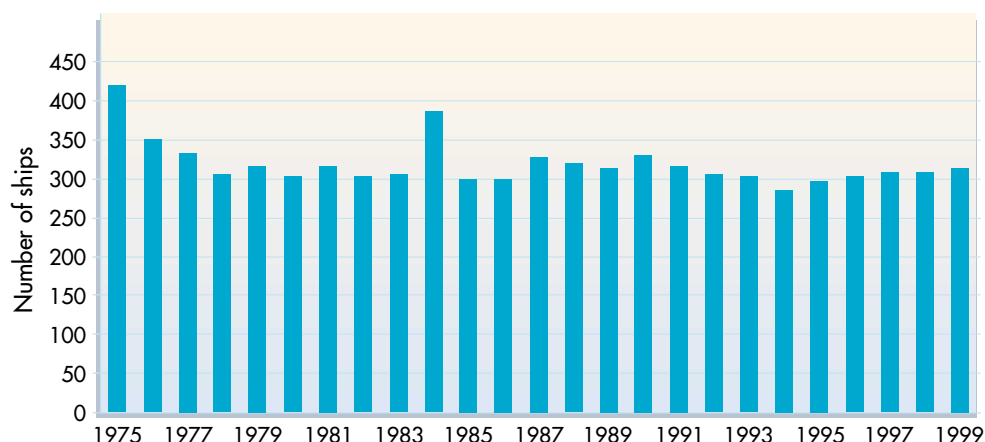
Source: U.S. Department of Transportation, Maritime Administration, *Marad '99* (Washington, DC: May 2000).

Figure 7-2

National Port Readiness Network: 2000

PUGET SOUND
Seattle, Tacoma, Indian Island

NEW YORK/ NEW JERSEY

SAN FRANCISCO BAY
Oakland, Concord

HAMPTON ROADS
Norfolk, Newport News

LA/LONG BEACH
Long Beach, Port Hueneme

WILMINGTON MOTSU
Wilmington, Morehead City

CHARLESTON

SAN DIEGO

SAVANNAH

JACKSONVILLE

HONOLULU
Pearl Harbor

CORPUS CHRISTI

PORT ARTHUR
Beaumont

Source: U.S. Department of Transportation, Maritime Administration, available at http://www.marad.dot.gov/nprn/index.html, as of July 2000.

activation. Fourteen U.S. commercial ports are designated by DOD as strategically important for the movement of military equipment and supplies (figure 7-2). As outlined in USDOT/DOD Memorandum of Agreement on Port Readiness, a number of agencies are involved in the operation of militarized ports and port facilities during war or national crises. Included among these are the USCG (e.g. harbor defense, port security, port safety and vessel traffic management), DOD's Transportation Command (Military Sealift Command and Military Traffic Management Command), the Army Corps of Engineers

(channel maintenance and wreck removal) and the Maritime Administration (contractual arrangements). Local Port Readiness Committees, chaired by USCG Captains of the Port, provide effective coordination at the executive level.

■ To increase the size of our U.S.-flag fleet, the President's National Shipbuilding Initiative (NSI) is being implemented through the Maritime Guarantee (Title XI) program. Under the NSI, the Title XI program was expanded to include financing for exporting vessels constructed in U.S. shipyards and modernizing U.S. shipyard facilities.

As mentioned in Chapter 4, the number of U.S.-flag ships has been declining, and the nation's shipbuilding capacity has fallen. National security considerations might require increasing the number of U.S.-flag ships of the dry bulk fleet, increasing jobs for U.S. merchant mariners, and increasing the percentage of U.S. foreign commerce carried on U.S.-flag vessels in order to maintain the economic viability of our U.S. merchant fleet as well as its availability for national security use.

Airlift

Airlift is both the means of delivery and the sustainable lifeline for troops until sea lines of communication can be established. A significant part of the nation's mobility resource is the Civil Reserve Air Fleet (CRAF)—aviation's equivalent of the MSP. Selected aircraft from commercial U.S. airlines are contracted to CRAF to support DOD emergency airlift requirements should airlift needs exceed military aircraft capabilities. The CRAF has three main segments: international airlift, national airlift, and aeromedical evacuation. The international segment is divided into long- and short-range sections, and the national segment into domestic and Alaskan sections.

To belong to CRAF, commercial airlines contract to activate their aircraft, as needed, to support CRAF segments. To provide incentives for civil carriers to commit aircraft to the CRAF program, Air Mobility Command (AMC) awards peacetime airlift contracts to civilian airlines that offer aircraft to the CRAF. The International Airlift Services contract is the largest of these. For fiscal year 1999, the guaranteed portion of the contract is $345 million, and AMC estimated that throughout fiscal year 1999, it would also award more than $362 million in nonguaranteed business. Carriers also must commit and maintain at least four complete crews for each aircraft [USAF 1999]. As of October 1, 1998, 35 carriers and 657 aircraft were enrolled in CRAF (table 7-3).

Ground Transportation

The nation's rail and highway systems play critical roles in the movement of military equipment and personnel during peacetime and, particularly, in wartime. When a contingency arises, huge amounts of military equipment and personnel are moved expeditiously from various continental U.S. (CONUS)-based military installations to various seaports and airports. Most of this equipment is convoyed over U.S. highways.

Table 7-3
Members of the Civil Reserve Air Fleet (CRAF)

Long-Range International
Air Transport International
American International Airways
American Airlines
American Trans Air
Arrow Air
Continental Airlines
Delta Airlines
DHL Airways
Emery Worldwide
Evergreen International
Federal Express Airlines
Fine Airlines
North American Airlines
Northwest Airlines
Polar Air Cargo
Sun Country Airlines
Tower Air
Trans Continental Airlines
United Airlines
United Parcel Service
World Airways

Short-Range International
Alaska Airlines
American Trans Air
DHL Airways
Evergreen International
Express One
Miami Air International
Sun Country Airlines
Sun World
US Airways Shuttle

Aeromedical Evacuation
Delta Airlines
US Airways

Domestic
America West Express
Reno Air
Southwest Airlines

Alaskan
Northern Air Cargo
Reeve Aleutian
Lynden Air Cargo

Source: U.S. Department of the Air Force website, USAF Fact Sheet, May 1999.

The Strategic Highway Network (STRAHNET) system of public highways forms a key component of U.S. strategic defense policy, providing access, continuity, and emergency transport of personnel and equipment in times of peace and war. The 61,000-mile system comprises about 45,400 miles of Interstate and defense highways and 15,600 miles of other important public highways.

STRAHNET is complemented by about 1,700 miles of STRAHNET Connectors—additional highway routes linking more than 200 important military installations and ports to the network. These routes are typically used when moving personnel and equipment during mobilization or deployment and generally terminate at the port boundary or installation gate. It is these routes where infrastructure deficiencies are most likely to occur because connector roads tend to be secondary facilities. Therefore, STRAHNET Connectors are a subject of continuous scrutiny and emphasis for the transportation community.

> *"The National Highway System is essential to our ability to move equipment and personnel in support of contingencies or peace-keeping efforts anywhere in the world."*
>
> **Lt. Gen. Kenneth R. Wykle, USA,** Deputy Commander in Chief, U.S. Transportation Command, Mar. 2, 1997

Together, STRAHNET and STRAHNET Connectors define the minimum public highway network needed to support defense emergencies. Because of national security importance, the Intermodal Surface Transportation Efficiency Act of 1991 and the National Highway System Designation Act of 1995 provided for inclusion of STRAHNET and important STRAHNET Connectors in the 161,000-mile National Highway System (NHS). Federal oversight ensures optimum maintenance levels for the NHS and assures that roads can support emergency deployment. With DOD's current emphasis on CONUS-based military units, the NHS will play an increasingly important role in future deployment scenarios.

In today's environment, the most important STRAHNET and Connector routes support the movement of Army and Marine Corps troops and equipment between the Power Projection Platforms (PPPs) and embarkation seaports. The majority of the Army and Marine Corps units will ultimately mobilize and deploy from PPP sites (figure 7-3).

The Military Traffic Management Command Transportation Engineering Agency (MTMCTEA) administers the Highways for National Defense Program on behalf of the U.S. Transportation Command. MTMCTEA works with the Federal Highway Administration (FHWA) to identify important defense highways and ensure that the infrastructure is able to support a defense emergency. Current initiatives involve documenting the condition and needs of PPP deployment routes.

Over the next few decades, the demand for personal travel and goods movement is expected to increase significantly. This increase in travel demand could impact defense mobility because of conflicts between military traffic and the demand for movement of people and goods. These conflicts be reduced, however, by the use of Intelligent Transportation System (ITS) technologies for communicating real-time information to users that will provide deployment officials with route guidance. The ITS system will use the existing highway and rail databases, be Internet accessible, capable of using video logs and remote sensing satellite imagery, and provide real-time information on traffic conditions, road closures, construction, and weather. The military will evolve into highly mobile, light, lethal forces that will reduce the current bridge, tunnel, and roadway structural requirements for tanks and other heavy equipment.

Vulnerability

One of USDOT's national security strategic goals is to reduce the vulnerability and consequences of intentional harm to the entire transportation system and its users. Such vulnerability exists in every country's transportation infrastructure. In the last quarter century, there have been intentional harmful attacks against every transportation mode in the United States,

The Strategic Highway Network (STRAHNET) and Major Military Deployment Sites: 2000
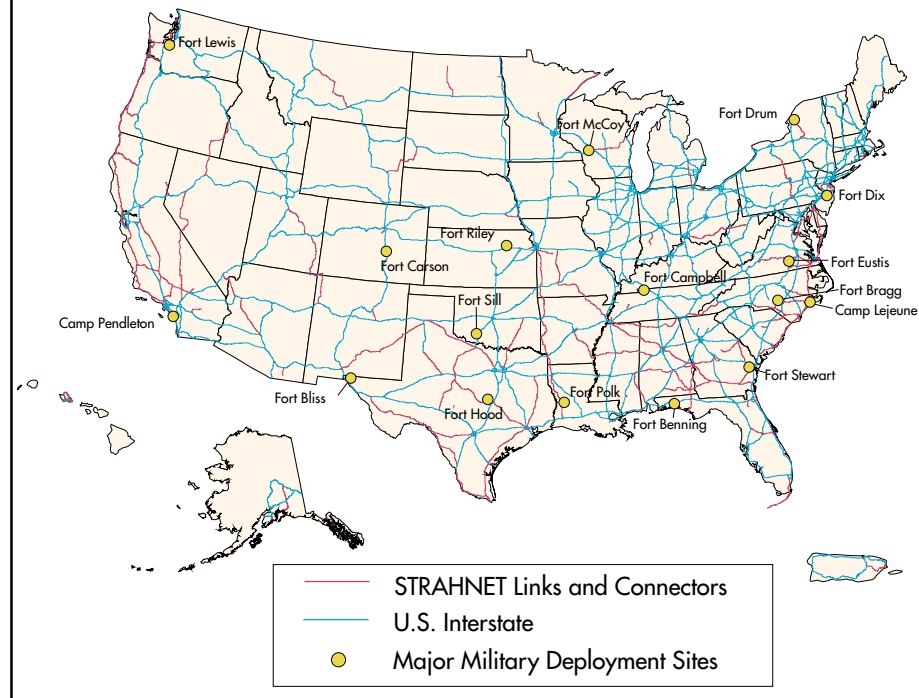
Source: U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Atlas Database, 2000; and military deployment sites information available at http://www.msrad.dot.gov/nprn/index.html, as of July 2000.

especially against the aviation system during the 1970s and 1980s. The visibility of aviation operations as symbols of national pride, the high loss of life that results from such incidents, and instantaneous worldwide media coverage makes aviation systems a favorite target of terrorists. The complex nature of protecting aviation from such attacks is discussed in the Threats to Aviation Security section of this chapter. The following section, Threats to Infrastructure Security, provides a discussion of all other transportation modes.

Threats to Infrastructure Security

To respond effectively, transportation security officials strive to identify threats and determine the vulnerability of transportation systems and to deter attacks through effective security enhancements.

The number of international terrorism incidents peaked in the mid-1980s (figure 7-4), led by a shift in terrorist tactics from hijackings to vehicle bombings, assassinations, and kidnappings in the Middle East, Europe, and Latin America.

During the mid-1980s, terrorism continued to pose a worldwide threat, and the U.S. government upgraded its antiterrorist organizations and resources. Although worldwide terrorist attacks declined during the 1990s, the number of casualties remained high. Locations of the attacks showed some marked trends (figures 7-5 and 7-6), which reveals that North America had the fewest terrorist attacks during this period.

By the early 1990s, terrorist threats and incidents shifted to transportation targets. Tokyo subway passengers were poisoned by a release of sarin nerve gas, allegedly by a religious cult; and there were violent attacks against transit passengers, vehicles, and systems in several parts of the world.

Figure 7-4
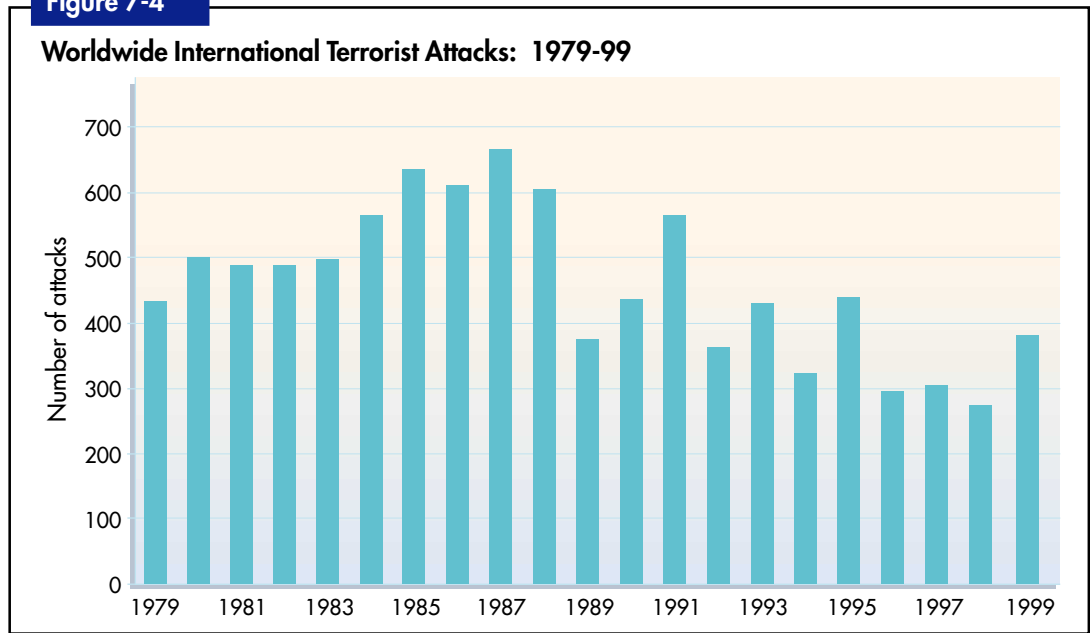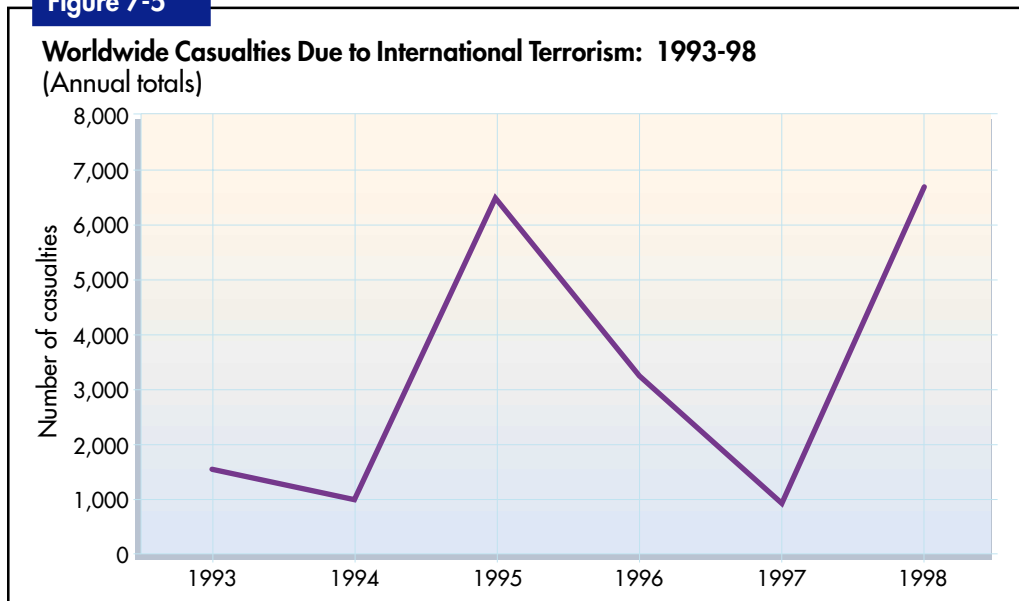
Worldwide International Terrorist Attacks: 1979-99

Source: U.S. Department of State, *Patterns of Global Terrorism 1998* (Washington, DC: 1999), appendix C.

Figure 7-5

Worldwide Casualties Due to International Terrorism: 1993-98
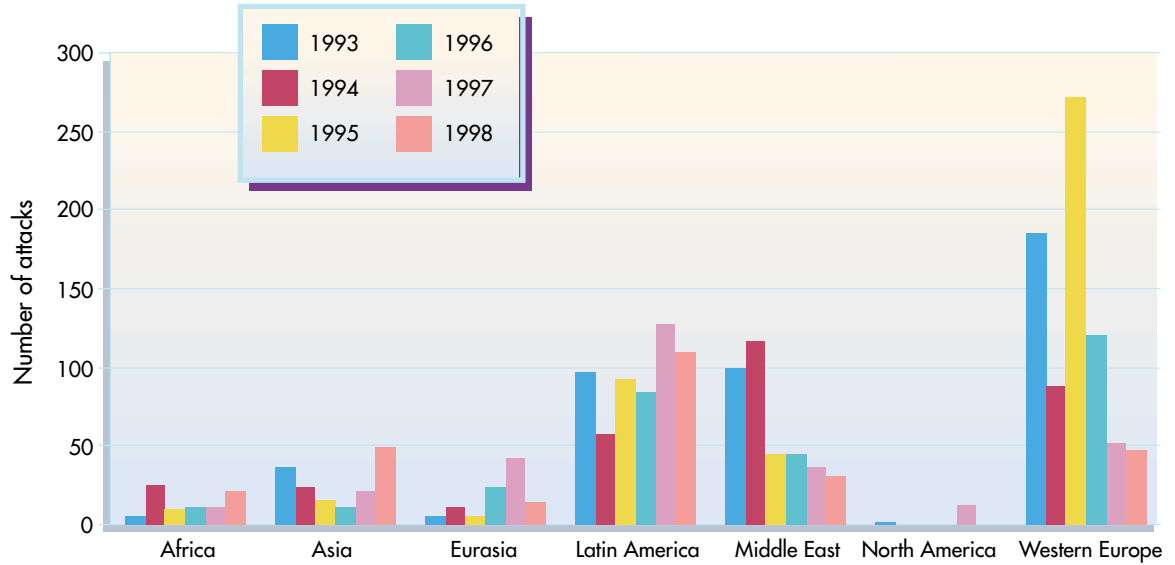(Annual totals)

Source: U.S. Department of State, *Patterns of Global Terrorism 1998* (Washington, DC: 1999), appendix C.

According to the Federal Bureau of Investigation (FBI), in the 1990s, U.S. terrorist incidents (actual, suspected, and prevented) varied from a low of one in 1994 to a high of 25 in 1997 (figure 7-7). The types of incidents and culprits varied during these years. In the early 1990s, bombings and arson predominated. By the late 1990s, letter bombs and large-scale vehicle bombs became the major concern, particularly following the Oklahoma City incident in 1995. Antigovernment organizations and "hate" groups were increasingly linked to these events.

Worldwide, transportation and transportation infrastructure are increasingly becoming targets of violent attacks by both terrorist and criminal elements. In 1998, there were 1,033 violent incidents against transportation worldwide, which was an increase of nearly 20 percent over the previous year and an increase of 107 percent since 1995 [USDOT OST OIS 1999]. Figure 7-8 shows worldwide violent attacks, by mode, in 1998, while figure 7-9 shows worldwide violent attacks against transportation, by region, for that same year. Many of these attacks against transportation were intended to cause mass casualties [USDOT OST OIS 1999].
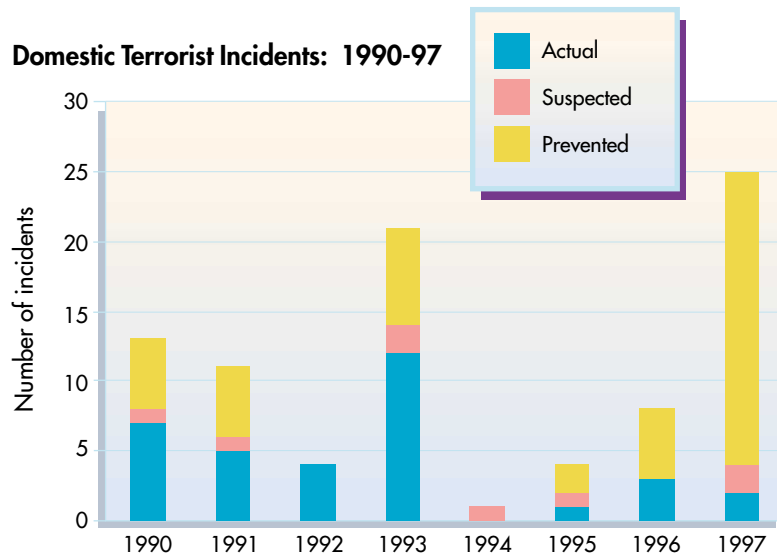
Figure 7-6

Worldwide International Terrorist Attacks by Region and Year: 1993-98

Legend: 1993, 1994, 1995, 1996, 1997, 1998

Y-axis: Number of attacks (0–300)

X-axis: Africa, Asia, Eurasia, Latin America, Middle East, North America, Western Europe

Source: U.S. Department of State, *Patterns of Global Terrorism 1998* (Washington, DC: 1999), appendix C.
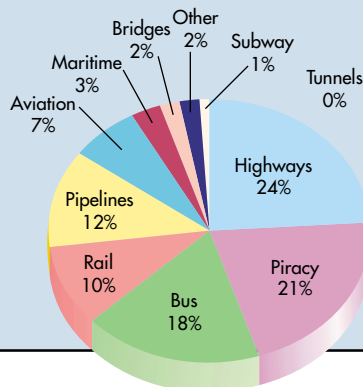
Figure 7-7

Domestic Terrorist Incidents: 1990-97

Legend: Actual, Suspected, Prevented

Y-axis: Number of incidents (0–30)

X-axis: 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997

Source: Federal Bureau of Investigation, *Terrorism in the United States–1997* (Washington, DC: 2000), p. 3.

Figure 7-8

Worldwide Violent Acts Against Transportation by Mode: 1998

Pie chart: Bridges 2%, Other 2%, Subway 1%, Tunnels 0%, Maritime 3%, Aviation 7%, Pipelines 12%, Rail 10%, Bus 18%, Piracy 21%, Highways 24%

Source: U.S. Department of Transportation, Office of Intelligence and Security, *Worldwide Terrorist and Violent Criminal Attacks Against Transportation 1998* (Washington, DC: 1999), p. 4.
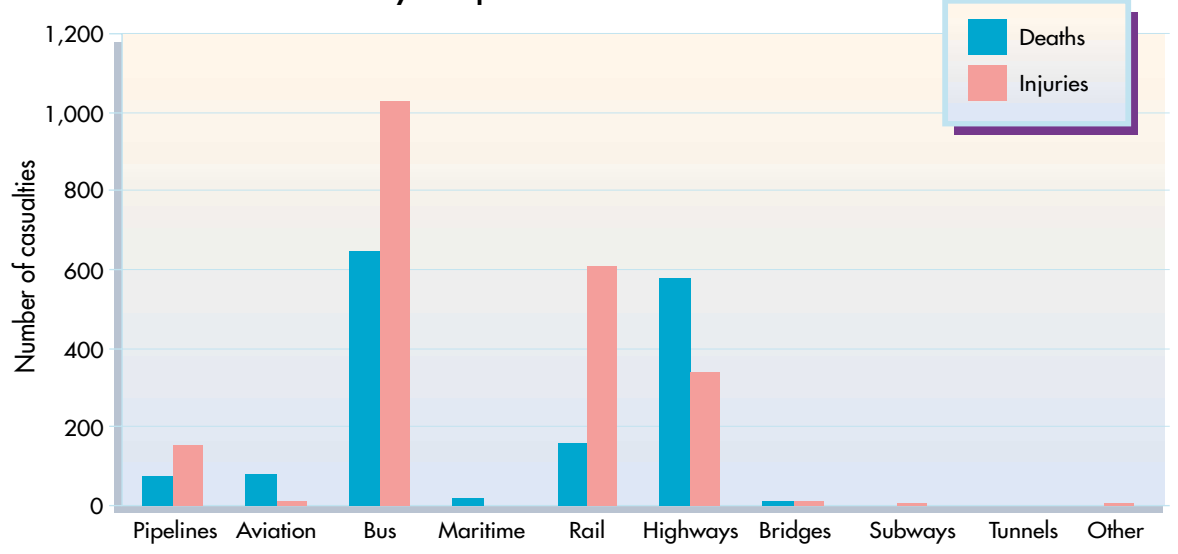
Figure 7-9

Terrorist Attacks Against Transportation by World Region: 1998
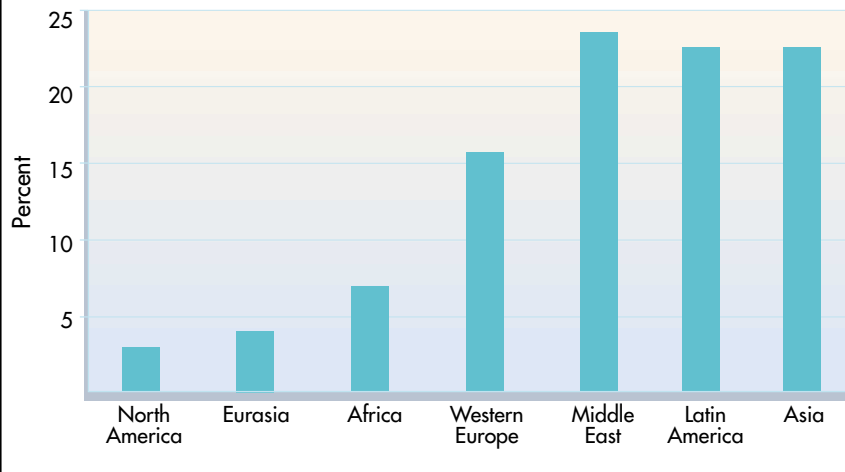
Source: U.S. Department of Transportation, Office of Intelligence and Security, *Worldwide Terrorist and Violent Criminal Attacks Against Transportation 1998* (Washington, DC: 1999), p. 17.

Figure 7-10 shows the number of deaths and injuries caused by terrorist and other violent attacks by mode worldwide. Nearly every attack on trains, buses, and public transit caused multiple casualties; bus passengers incurred the greatest number of casualties.

In North America, there were 27 violent acts against transportation reported in 1998; none involved international terrorists. Eleven of the incidents were against rail, including sabotage and derailment, attempted bombings, bomb threats, and one case of an incendiary device placed on railroad tracks. The remaining incidents included three bus hijackings; two planned or threatened attacks against bridges; three attacks against aviation; two pipeline bombings; and six maritime incidents that involved piracy, threats against cruise lines, bombing, and civil disobedience. Overall, five casualties were reported [USDOT OST OIS 1999].
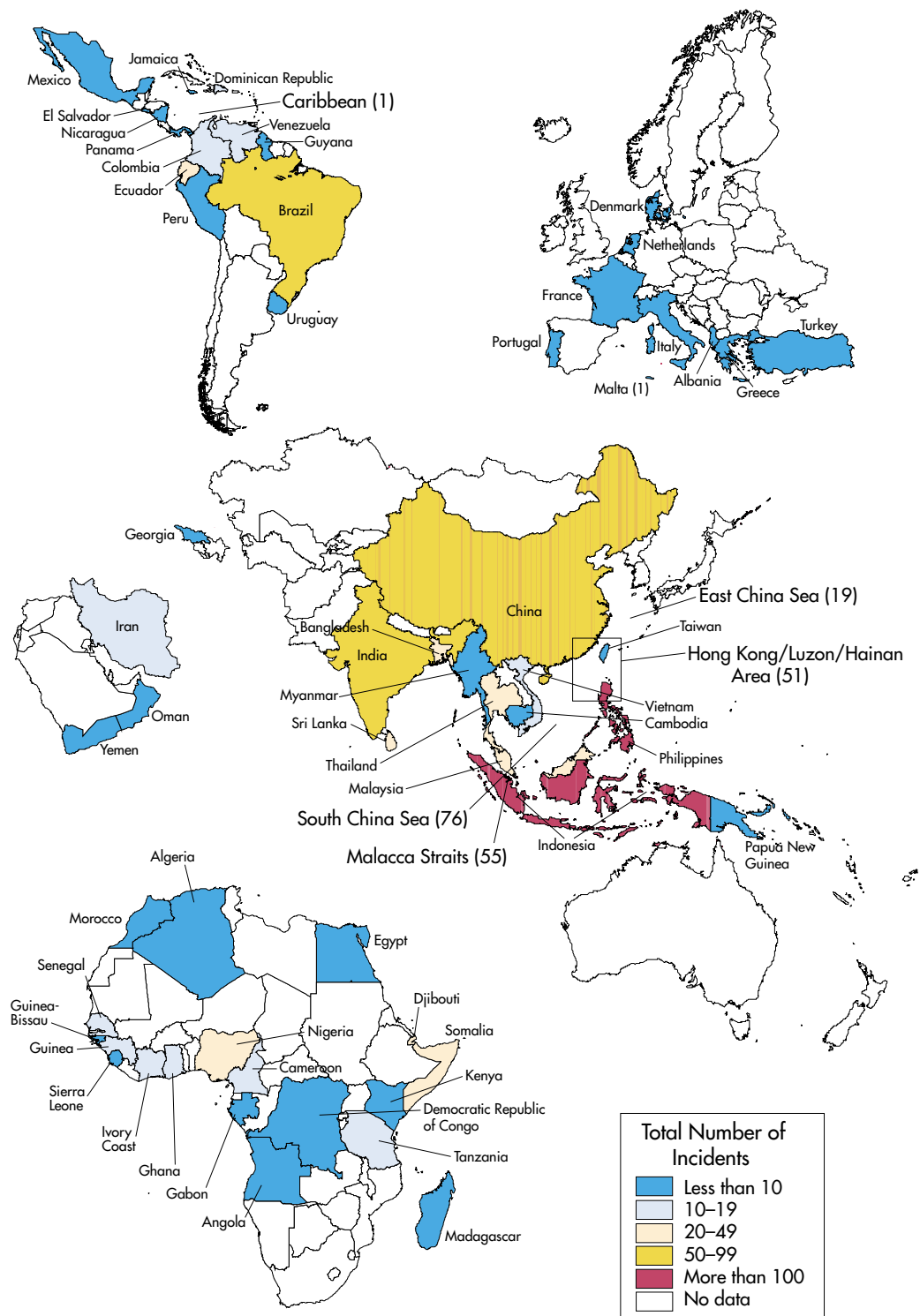
Maritime piracy attacks worldwide rose 50 percent between 1998 and 1999, and they continue to be centered in Southeast Asian waters [Parker 2000], where the Straits of Singapore are the most heavily trafficked maritime crossroads in the world [DOT OIS OST 1999] (figure 7-11).

Figure 7-10

Worldwide Terrorism Casualties by Transportation Mode: 1998

Source: U.S. Department of Transportation, Office of Intelligence and Security, *Worldwide Terrorist and Violent Criminal Attacks Against Transportation 1998* (Washington, DC: 1999).

Figure 7-11

Worldwide Incidents of Piracy: Cumulative 1991 through 1999

Mexico
Jamaica
Dominican Republic
Caribbean (1)
El Salvador
Nicaragua
Venezuela
Panama
Guyana
Colombia
Ecuador
Peru
Brazil
Uruguay

Denmark
Netherlands
France
Turkey
Portugal
Italy
Malta (1)
Albania
Greece

Georgia
China
East China Sea (19)
Iran
Taiwan
Bangladesh
India
Hong Kong/Luzon/Hainan Area (51)
Myanmar
Vietnam
Sri Lanka
Cambodia
Oman
Thailand
Philippines
Yemen
Malaysia
South China Sea (76)
Malacca Straits (55)
Indonesia
Papua New Guinea

Algeria
Egypt
Morocco
Senegal
Djibouti
Guinea-Bissau
Somalia
Nigeria
Guinea
Cameroon
Kenya
Sierra Leone
Democratic Republic of Congo
Ivory Coast
Tanzania
Ghana
Gabon
Angola
Madagascar

Total Number of Incidents

- Less than 10
- 10–19
- 20–49
- 50–99
- More than 100
- No data

Note: Incidents took place in the territorial waters of respective countries.
Source: U.S. Department of Transportation, Maritime Administration, personal communication, May 2000.

These acts of piracy accounted for 20 percent of all transportation incidents. There were 209 reported acts of piracy/sea robbery committed against merchant shipping interests world-wide during 1998 (figure 7-12). Eighty-eight people were killed in these piracy incidents, an increase of more than 450 percent from 1997. There is no evidence to suggest that vessels of a specific flag were targeted in any given region, but 21 U.S.-flag vessels have been attacked over the last five years [USDOT OST OIS 1999]. The majority of these attacks took place at night while vessels were at anchor.

Figure 7-12

Maritime Piracy Incidents: 1991-99
(Annual totals)
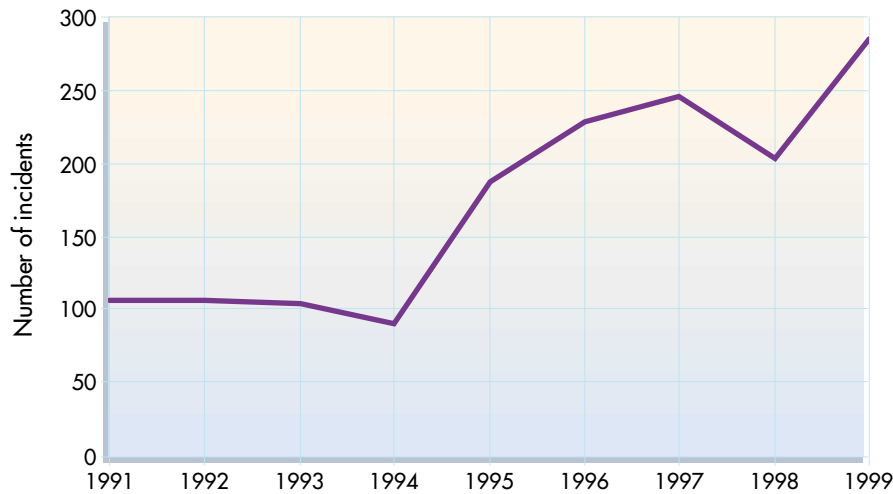
Source: International Chamber of Commerce, International Maritime Bureau, Maritime Piracy Annual Report, available at http://www.iccwbo/ccs/menu_imb_piracy.asp, as of October 2000.

There were 122 attacks worldwide against pipelines in 1998, a 15 percent increase from 1997. Eighty of these incidents were international terrorist attacks, and all but five of the attacks were bombings. Seventy-four people were killed in these attacks [USDOT OST OIS 1999]. Pipelines are regarded as easy targets because they often traverse many miles of isolated territory virtually unprotected.

In 1998, highway infrastructure was the most frequently attacked transportation target worldwide. There were 242 such attacks in 1998, in which 579 people were killed. Eleven of these incidents were terrorist attacks. Additionally, there were 22 attacks against bridges and 4 attacks against tunnels in 1998. One bridge incident was an international terrorist attack [USDOT OST OIS 1999].

The increasing reliance of the transportation system on sophisticated electronic information and communications systems in day-to-day operations is a cause for concern due to the possibility of cyber-based disruptions of key support services. Examples of these services include the extensive and growing use of Electronic Data Interchange (EDI) and the Internet to conduct business, air traffic control as part of the National Airspace System (NAS), extensive use and dependence on the Global Positioning System (GPS) for navigation functions, the rapidly expanding use of Intelligent Transportation Systems (ITS), the railroad signal system, and the use of Internet-Based Supervisory Control And Data Acquisition (SCADA) systems to control modern pipeline operations. All of these contribute to a more efficient transportation system, but at the same time, these developing technologies make our transportation system vulnerable to cyber attack.

Box 7-1

The Y2K Challenge
The Y2K problem (as it is popularly known), caused by the practice of two-digit coding of years in computer databases, could have caused serious problems in some of the transportation's mission critical systems (e.g., the FAA's air traffic control system and the USCG's search-and-rescue and GPS services). A four-year, $400 million effort by the USDOT prevented serious disruptions to transportation services as we turned the century and the millennium.

During the late 1990s, the security of the nation's transportatio system, the potential counter-measures, and the need for improvements were catalysts for the creation of the President's Commission on Critical Infrastructure Protection. This Commission was formed to review the physical and electronic, or cyber, vulnerabilities of transportation, as well as other vulnerable areas of the nation's critical infrastructure sectors.

The Commission recommended education and awareness programs, research and development (R&D), improved threat assessment capabilities and information sharing, and a national structure to determine who would carry out these activities and how they would be coordinated. In transportation, the Commission was particularly concerned about two potential vulnerabilities—satellite-based GPS, particularly if it becomes the sole source for radio-navigation for aircraft landings, and the NAS, including Federal Aviation Administration (FAA) air traffic control facilities.

In May 1998, President Clinton issued two Presidential Decision Directives (PDDs): Combating Terrorism [Clinton 1998a] and Protecting America's Critical Infrastructure [Clinton 1998b]. The President formalized the role of the National Coordinator for Security, Infrastructure Protection, and Counterterrorism as a senior position in the National Security Council (NSC). New interagency organizations—the Critical Infrastructure Assurance Office, the National Infrastructure Protection Center, and the National Infrastructure Assurance Council—were established to oversee the implementation of the President's Commission recommendations. At the same time, DOD designated National Guard units in 10 states to create teams to train and assist state and local "first responder" agencies in chemical and biological incidents within the United States.

PDD 63 established the need for a new private-public sector partnership to combine the resources of both the transportation industry and the federal government to identify new threats and vulnerabilities emerging from the growing information-based global economy. The USDOT has the lead in working with the transportation industry sector coordinator in establishing this partnership and ensuring U.S. critical infrastructures are protected for the nation's security and economic well-being.

In June 1999, the President's National Security Telecommunications Advisory Committee, in the *Transportation Information Infrastructure Risk Assessment Report*, recommended steps to increase awareness and information about the cyber threat to the transportation system and its information resources [NSTAC 1999]. The panel contended that the continued implementation of new technologies made the potential impact of disruptions to transportation systems even more significant than in the past and proposed expanding R&D into countermeasures. Collectively with the nation's defense agencies, the USDOT intends to protect our transportation system by identifying threats, determining the extent of vulnerability to which the system is exposed, and using effective security enhancements to deter attacks.

In August 2000, President Clinton released the report of the Interagency Commission on Crime and Security in U.S. Seaports. The Commission's report identifies threats to our seaports and recommends a number of measures aimed at reducing the vulnerability of maritime commerce and the Marine Transportation System infrastructure that supports it. Hearings in the Senate were held in October 2000 to discuss recommendations of the report and how best to meet these challenges. The USCG unveiled the concept of Maritime Domain Awareness to help meet several of the report's key recommendations.

Keys to the Future

Terrorism is a growing threat against transportation and transportation infrastructures in the United States and throughout the world:

- Today's terrorist groups are fluid and multinational.

- Growing international support networks enhance the ability of extremists to operate in the United States.

- The rise of extremism is threatening stability in the Middle East and elsewhere in the world.

- The breakup of the Soviet Union and the Warsaw Pact has unexpectedly contributed to global instability through increased ethnic strife.

- Cults, such as the Japanese Aum Shin Rikyo, pose a growing threat.

The World Trade Center bombing in New York, on February 26, 1993, and the Oklahoma City bombing of the Alfred P. Murrah Federal Building, on April 19, 1995, stunned the U.S. public. These incidents make it clear that symbols of the United States and those of its trade and commerce are just as vulnerable to terrorist targets as similar targets in other countries worldwide.

Our transportation system has not escaped the attention of terrorists, as underscored by the 1993 planned bombings of the Lincoln and Holland tunnels and the George Washington bridge in New York City by the same individuals who bombed the World Trade Center. Overseas, a series of sarin gas attacks in the Tokyo subway system by the Aum Shin Rikyo religious cult in March 1995 marked the first large-scale use of chemical agents as a weapon of mass destruction against a civilian transportation target.

Technology has added to the terrorist threat. Since the breakup of the Soviet Union, sophisticated arms and weapons systems are available to terrorists at competitive prices, and there is an increasing likelihood that terrorists may try to use weapons of mass destruction/disruption (chemical, biological radiological, and information warfare).

Confronting and preventing this new class of threats before reaching our land, maritime, aerospace, and cybernetic borders are not simple tasks. They require a balance between security imperatives and the need for a fast and efficient U.S. transportation system, a key contributor to the country's overall economic prosperity. The Secretary of Transportation has laid out a blue print that meets these new global threats head on. The *Marine Transportation System Report* provides direction for how we will meet our national security obligations.

The USCG has developed a concept called Maritime Domain Awareness (MDA). MDA is effective knowledge of all activities and elements that threaten the safety, security, or environment of the United States or its citizens. The USCG is unique in that it is the only federal agency that operates in both military and law enforcement environments, providing ties to the national foreign intelligence community (e.g., NSA, CIA, ONI) and domestic law enforcement databases (e.g., Customs, FBI). This capability, when linked from the Intelligence Coordination Center to other federal enforcement agencies and with USCG stations, aircraft, and cutters, will provide actionable information that will significantly improve our ability to address threats before they reach our borders.

Threats to Aviation Security

The emergence of globalization resulted in the worldwide spread of business affiliations, customers, suppliers, subsidiaries, and manufacturing sites. More passengers, both business and leisure, are taking advantage of air travel. This growth in air travel, coupled with potential increased threat, has created concern for the safety and security of travelers.

Worldwide, incidents of unlawful interference with civil aviation, primarily hijacking and sabotage, have decreased since the 1970s (figure 7-13), while the number of flights, enplanements, and passenger-miles flown by scheduled air carriers has increased.

With hijackings becoming an all too frequent occurrence in the late 1960s and early 1970s, air carriers voluntarily cooperated with the federal government on measures to counter the threat. Providing security is now treated by air carriers and airports as a cost of doing business.

Figure 7-13

Hijackings Worldwide: 1970-98
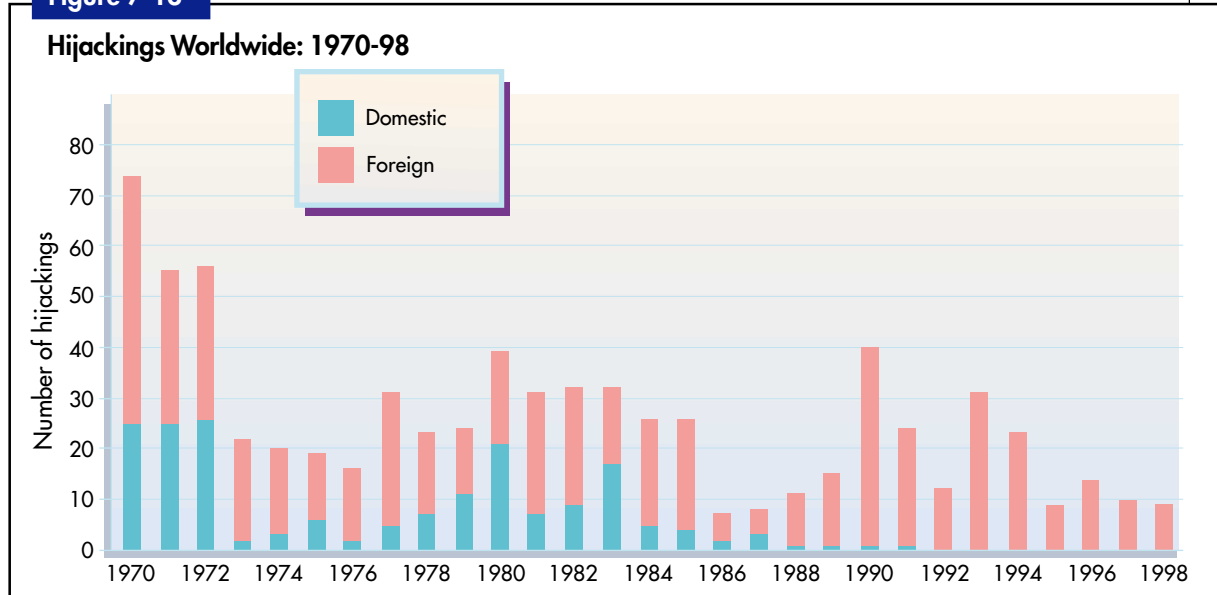
Source: U.S. Department of Transportation, Federal Aviation Administration, *Criminal Acts Against Civil Aviation–1998*, available at http://cas.faa.gov/crimacts/index.html, as of September 18, 2000.

While in the United States there were 142 domestic hijackings between 1961 and 1972 and 8 explosions aboard commercial aircraft between 1955 and 1976 [Harris 2000], only the September 1976 hijacking at LaGuardia Airport was clearly linked to terrorism.

Throughout the 1970s and into the 1980s, the United States and the world aviation community took action to stop hijacking attempts using a broad range of strategies, including:

- more effective passenger and baggage screening,
- imposition of contingency or extraordinary security measures in special circumstances,
- worldwide use of X-ray and metal detection equipment,
- in-depth assessments of U.S. and foreign airport and air carrier security,
- establishment of the U.S. Federal Air Marshal Program,
- tightened control of access to aircraft and security-sensitive areas,
- more R&D of explosives detection and other security technologies,
- improved analysis of intelligence on terrorist activities, and
- improved technical assistance and training for operators and personnel.

In addition to these strategies, the FAA is considering legislation to improve personnel selection criteria and training standards for aviation security (box 7-2).

Box 7-2

Aviation Security Training
Proper deployment of highly sophisticated screening devices requires employment of trained operators capable of following procedures and making appropriate decisions. However, this need is compromised by high turnover rates for screeners due to low wages and a tight labor market.

The FAA's proposed "Certification of Screening Companies" rulemaking offers the public an opportunity to comment on selection criteria and training standards and to seek ideas for improving aviation security training. Proposals have been made for the FAA to mandate 80 hours of intensive classroom/laboratory training and 40 hours of on-the-job training before performance certification for all airline security screening personnel.

Currently, the FAA and airlines are deploying elements of the Screener Proficiency Evaluation and Reporting System (SPEARS), a major FAA effort to improve training and monitor screener effectiveness. SPEARS has computer-based training modules, which are effective and efficient methods for training screeners. These have been installed at 17 major airports.

The other SPEARS component, Threat Image Projection (TIP), is a system whereby artificial images of improvised explosives devices and other threat objects are presented to the screener during the performance of normal duties as if objects actually were in baggage. The screener's decisions are tabulated and recorded to furnish real-time feedback for effectiveness monitoring and as a training tool. Approximately 300 TIP systems are being deployed to the 19 busiest airports.

In addition, the FAA provides formal training through airport security seminars for law enforcement officers and airport personnel. Aviation security special agents also provide one or two hours of instruction in airline training courses. Similar participation occurs in industry association-sponsored schools and conferences.

Source: White House Commission On Aviation Safety and Security, *The DOT Status Report,* available at http://www.dot.gov/affairs/whcsec3.htm, as of July 26, 2000.

The vast majority of criminal and terrorist acts against civil aviation during the 1980s took place overseas [Simon 1994]. The bombing of Pan Am Flight 103 over Lockerbie, Scotland, during a flight from Frankfurt in December 1988, stimulated the most significant changes in aviation security since the early 1970s. The Lockerbie disaster turned the world's focus toward finding and developing new technologies to detect concealed explosives in passenger baggage.

In 1990, the Aviation Security Improvement Act strengthened the role of the federal government in civil aviation security. The Act instructed the FAA to fund the development of Explosives Detection Systems (EDSs), establish EDS certification standards, and test and certify potential EDSs for eventual deployment. Since 1990, both the Office of the Secretary of Transportation and the FAA have upgraded those organizations that handle aviation security. Both are headed by senior executives who report directly to the Secretary or the FAA Administrator.

The U.S. aviation system has been on heightened security status since 1995, and security measures overseas have been adjusted numerous times since then. The decision to increase security in 1995 was based on information provided by federal law enforcement and intelligence agencies, combined with an analysis of the state of affairs at the time.

On July 25, 1996, after the loss of TWA Flight 800, President Clinton established the White House Commission on Aviation Safety and Security, chaired by Vice President Gore, and directed that preflight security inspections be conducted on all overseas international flights. The Commission recommended the following procedures:

- Improve baggage checking and checkpoint screening by deploying advanced security technologies.

- Require certification of security screening companies and improve personnel.

- Strengthen security through consortia and partnerships with airport, airline, and law enforcement personnel.

- Perform unannounced, realistic operational tests of security systems.

- Require enhanced controls on access and movement in secure areas of airports.

Air carriers bear the primary responsibility for applying security measures to passengers, service and flight crews, baggage, and cargo. Airports, run by state or local government authorities, are responsible for maintaining a secure ground environment and for providing law enforcement support for implementation of airline and airport security measures. All major air carriers assume operations costs for installed EDSs and other technologies, and pay maintenance costs to cover service performed after warranties have expired and following initial maintenance periods. About 100 companies conduct screening at airports in the United States [65 *Federal Register* 559], with at least 16 different companies, including two air carriers, conducting screening at the 19 busiest airports [USDOT FAA 1998].

The FAA has purchased and deployed advanced security technologies, including more than 100 EDS devices for checked baggage screening and more than 570 explosives trace detection devices for use at screening checkpoints at more than 90 U.S. airports [Flynn 2000]. Voluntary security consortia have been established at 170 airports. Here government agencies and airline industry representatives assess and discuss security and work together to eliminate vulnerabilities. Interagency efforts to assess and mitigate potential threats posed by chemical and biological weapons and surface-to-air missiles actively continue.

Keys to the Future

The U.S. government works with the International Civil Aviation Organization (ICAO) to strengthen international security standards. The FAA is pursuing R&D in aviation security to provide the technologies and tools necessary to cope with new threats and improve existing countermeasures. Hardening standards are being studied for new aircraft, and a transition to hardened containers to prevent catastrophic damage from explosive devices is underway. Human factors research is being emphasized to aid in identifying threats, interacting with advanced technology, and determining hiring qualifications and specialized training requirements [Flynn 1999].

Historically, explosives and other improvised explosive devices, as well as weapons concealed on individuals, accounted for a high percentage of all civil aviation security incidents. Consequently, the FAA is working to improve the detection of explosive devices concealed in carry-on bags and to do so economically, without introducing significant operational delays. Conventional metal detectors are generally considered effective for weapons detection, although other detection means may be required.

Research to reliably detect explosive components and weapons carried by people continues to be emphasized. The FAA's R&D program conducts a systematic assessment of checkpoint security devices and techniques. Based on these assessments, a checkpoint security screening model will be developed to create a checkpoint architecture for the future. This architecture will address the mandates of both security and operations and will form the basis for testing prototype configurations in airports [Roder 1999].

Following the recommendations of the White House Commission on Aviation Safety and Security, the federal government resumed a practice not used since the height of the hijacking

threat in the mid-1970s—the government purchase of security equipment for use by private-sector air carriers to screen passengers and baggage prior to boarding. The FAA plans, in the near term, to continue purchasing EDSs and other advanced security technologies for expedited deployment as part of an overall effort to improve security [Tucker 2000].

In the coming years, the FAA also plans to deploy an increasing number of EDSs and explosives trace detection devices at a steady rate. It also plans to replace every checkpoint X-ray device in the country with models that feature Threat Image Protection (TIP). The number of explosives detection canine teams subsidized and certified by the FAA rose from 87 teams at 26 airports in 1996 to 174 teams at 39 airports in 1999. The FAA has canine teams at all major airports, and growth in this program is expected to continue [Flynn 2000].

The destruction of Pan Am Flight 103 in 1988, the French airline Union de Transport Aeriens (UTA) Flight 772 in 1989, and the hijacking of Indian Airlines Flight 814 in 1999 are reminders that aviation security is an international concern (box 7-3). There is a need for improved security through better screening equipment operated by carefully selected and well-trained and tested screening personnel [Flynn 1999]. Additionally, R&D can improve explosives and weapons detection, technology integration, aircraft hardening, and aviation security human factors.

Ensuring effective screening of ever-increasing numbers of passengers, baggage, and cargo on more flights without restricting movement remains the greatest challenge for the future. To overcome this challenge, U.S. airlines must continue to work together and embrace improved aviation security as part of their mission to provide better service to their customers and a safer environment for all passengers [Garvey 1999].

Box 7-3

Attacks on Aviation System

June 14, 1985: Trans World Airlines (TWA) Flight 847 from Athens, Greece, was hijacked. The hijacking lasted 17 days before the terrorists released the aircraft and its remaining hostages in Beirut, Lebanon.

June 23, 1985: Air India Flight 182 from Toronto and Montreal to India crashed at sea after an explosion in the front cargo hold, probably caused by a bomb. All 329 passengers were killed, including 22 U.S. citizens. The same day at Tokyo's Narita Airport, a checked bag being transferred from a Canadian Pacific to an Air India flight exploded, killing two baggage handlers and injuring others.

November 23, 1985: An EgyptAir flight was hijacked enroute from Athens to Cairo and diverted to Malta. An Egyptian commando unit stormed the plane after several passengers were shot, including three Americans, because Malta authorities failed to meet hijacker demands. A total of 59 of 96 passengers died in the fire and gun battle.

December 27, 1985: Simultaneous attacks occurred at two European airports in open terminal areas. Sixteen people were killed and 74 wounded at Rome's Leonardo da Vinci International Airport, including 5 Americans; 3 persons were killed and 45 wounded at Vienna's Schwechat International Airport.

April 2, 1986: A bomb placed onboard TWA Flight 840 detonated enroute from Rome, Italy. Four passengers were killed, but the aircraft made a safe landing in Athens, Greece.

May 30, 1986: The FBI and Canadian authorities uncovered a terrorist conspiracy to bomb an Air India jet departing from JFK International Airport. Five individuals were charged with sabotage; two were convicted and sentenced to life imprisonment.

Box 7-3 *continued*

September 5, 1986: Terrorists assaulted Pan Am Flight 73 in Karachi, Pakistan, as the aircraft waited to depart. After 17 hours of negotiations, the aircraft's auxiliary power unit failed. Anticipating an attack by security forces, the terrorists opened fire on the massed passengers, killing 22 persons and injuring 125 others before security forces could intercede.

November 29, 1987: A bomb on Korean Airlines Flight 858 detonated over the Indian Ocean. All 115 persons onboard were killed.

April 5, 1988: Kuwait Airways Flight 422 was hijacked enroute from Bangkok, Thailand. The hijackers left the aircraft 15 days later in Algiers, Algeria, after the Kuwait government refused to release prisoners in exchange for hostages. The hijackers had killed two Kuwaiti passengers to emphasize their demands.

December 21, 1988: Pan Am Flight 103 was destroyed in flight by a bomb placed in checked baggage. All 243 passengers and 16 crew on board, plus 11 people on the ground at Lockerbie, Scotland, were killed. Subsequent inspection of the reconstructed aircraft determined that a device consisting of plastic explosives inside a tape cassette player was concealed in checked luggage.

September 19, 1989: Union de Transport Aeriens (UTA) Flight 772 was destroyed by a bomb over Chad, 9 months after the Pan Am 103 explosion over Lockerbie. All 171 persons on board were killed, including 7 Americans.

November 11, 1989: A bomb placed in the cabin area onboard Avianca Flight 203 detonated over Colombia, destroying the aircraft in flight. One hundred seven passengers and crew were killed.

Attacks on Aviation System
July 19, 1994: An Alas Chiricanas Airline plane exploded in flight over Panama, killing all 21 people on board, including three U.S. citizens.

December 11, 1994: On Philippine Flight 434, a bomb detonated enroute to Tokyo from Cebu. One passenger was killed.

December 24, 1994: While on the ground at Houari Boumedienne International Airport, Algeria, Air France Flight 8969 was commandeered by four terrorists armed with automatic weapons, hand grenades, and other explosives. The hijackers killed three passengers. French counterterrorism forces stormed the aircraft at Marseille Marignane Airport; all four hijackers were killed.

In addition to these incidents, individual acts of revenge or criminal activity are noted below.

December 7, 1987: Pacific Southwest Airlines Flight 1771 crashed after a recently terminated airline employee boarded the Los Angeles-San Francisco flight with a handgun, shot one passenger (his former supervisor), the flight crew, flight attendant, and presumably himself. All 38 passengers and five crew on board were killed.

May 7, 1995: A man armed with a semiautomatic rifle attempted to enter a secure area through a door in the baggage claim area at Minneapolis/St. Paul International Airport. Unable to gain access, the gunman proceeded through the terminal firing his weapon. He exited the terminal to a public driveway, exchanged fire with responding police officers, and was shot three times before being apprehended. Flying debris injured three people, none seriously. The gunman never gained access to secure areas of the airport.

Source: U.S. Department of Transportation, Federal Aviation Administration, *FAA Historical Chronology — 1926 to 1996,* available at www.faa.gov/newsroom.htm, as of October 24, 2000.

Threats to Maritime Security

Our National Security roles go beyond military operations to include activities such as drug interdiction. The United States has aggressively battled drug control since the 1930s when the Federal Bureau of Narcotics was established. Nevertheless, the U.S. population today is becoming the world's largest illegal drug consumer.

Although U.S. citizens and government officials have been concerned about illicit drug consumption for many decades, the United States did not begin focusing significant attention on the problem until the late 1960s. The sharp increase in illicit drug use in the United States during that decade prompted the government to adopt a policy that remained relatively consistent for more than 20 years. Starting with "Operation Intercept," the U.S. government began a rigorous inspection program along the U.S.-Mexican border in 1969.

Historically, U.S. policymakers have assumed that a key part of the overall strategy to reduce domestic illicit drug consumption is to reduce the supply of drugs entering the United States from international locations. There has been some success with this strategy. For example, changes in opium production methods in Turkey, from opium gum to poppy straw concentrate, made illicit production of opium poppy and heroin more controllable. This technological change and subsequent enforcement actions by the Turkish and U.S. governments reduced imports of opium into the United States in the early 1970s. A U.S.-supported aerial campaign in Mexico in the late 1970s also was successful, significantly reducing the illegal import of marijuana into the United States.

Throughout the 1980s, the "war on drugs" focused on stopping illegal drugs at the source. Latin American governments were strongly pressured by the United States to intensify their drug control efforts. By the late 1980s, most cocaine entering the United States was flown directly from the producing countries of South America into northern Mexico, where the cargo was transported by truck across the border. However, in response to joint U.S.-Mexican drug interdiction efforts in northern Mexico, traffickers began to adjust their routes and moved their operations and staging areas to southern Mexico and neighboring Central American countries.

The U.S. military was enlisted in drug control efforts during the 1980s by a sequence of laws that gradually expanded the military's role in this effort. In 1988, Congress gave the military the ability to engage in drug control activities by authorizing them to search, seize, and arrest outside the land area of the United States.

Today, the U.S. Coast Guard (see box 7-4) focuses on interdicting illegal drugs by using a "layered" defense, attempting to interdict illegal drugs in their departure zones, in the transit zones in the Pacific Ocean and Caribbean Sea, and in the arrival zone in the United States. To do this, they use a variety of surface and air assets.

In 2000, the USCG seized 132,919 pounds of cocaine with an estimated street value of $4.4 billion—the equivalent of about 600 million individual doses. In response to President Clinton's National Drug Control Strategy, the USCG developed new techniques and operations aimed at stopping illegal drug suppliers, while other agencies worked on reducing U.S. demand for the smugglers' products. The 2000 seizures marked the most successful year in this effort [USDOT USCG 1999].

The USCG has enforced immigration laws, as directed by the President and Congress, virtually since the birth of the United States. The USCG's introduction to immigration enforcement came with the passage of antislavery legislation in the late eighteenth and early nineteenth centuries. As the federal government's only means of enforcing laws on the waters surrounding the nation, the Revenue Cutter Service, forerunner of the USCG, was charged with enforcing the nation's antislavery laws. The service's responsibilities increased as Congress passed immigration restrictions, primarily concerning Chinese immigration, in the mid-nineteenth century.

The mission first gained high visibility during the first mass migration emergency the United States faced in 1980 when approximately 124,000 undocumented Cuban migrants entered the United States by sea in what became know as the Muriel Boatlift. The hazards of illegal maritime migration were highlighted in 1981 when the bodies of 30 Haitian migrants washed ashore in Florida. These events led to Presidential Proclamation 4865, which suspended the entry of undocumented migrants to the United States from the high seas.

Between 1991 and 1995, there was a dramatic increase in the number of undocumented migrants interdicted by the USCG. During this period, over 120,000 migrants from 23 countries were interdicted, primarily from Cuba and Haiti. In 1992, Executive Order 12807 directed the USCG to interdict migrants at sea and return them to their country of origin or departure.

In 1994, the USCG was involved in its largest peacetime operation since the Vietnam War, responding to two mass migrations at the same time—first from Haiti, then from Cuba. Over 63,000 migrants were rescued, mostly from overloaded and unseaworthy watercraft, and prevented from illegally entering the United States. Illegal migration continues today, but the primary mode has changed from inner tubes, rafts, and overloaded boats to smugglers using fast-boats. This practice can be just as dangerous as rafting, however, as illustrated by the deaths of numerous migrants in 1998-2000 when overloaded vessels overturned.

The USCG has protected U.S. natural resources since the 19th century, starting with seals that were considered a major economic resource in Alaska for their furs and continuing today with protected marine resources and fisheries. Since the passage of the Fisheries Conservation and Management Act in 1976, which extended the U.S. Exclusive Economic Zone to 200 nautical miles, guarding American sovereignty over the richest fishing grounds in the world has been a primary USCG mission.

Keys to the Future

The National Drug Control Strategy recognizes the need to reduce demand for illicit drugs in the United States, calling for a 25 percent reduction by 2002 and a 50 percent reduction by 2007 [White House 1999]. Reaching the goal will require continued cooperation between U.S. government agencies, including the detection and monitoring resources of the DOD. International cooperation, especially between the United States and the nations and territories of

Latin America and the Carribean Basin, will be pivotal for further strides in reducing drug flow.

Drug traffickers and migrant smugglers move quickly and adapt new smuggling routes and methods in reaction to law enforcement presence. Recent record cocaine seizures in the eastern Pacific indicate that drug traffickers are increasingly targeting southern California and the southwest border. Cooperative efforts involve sharing intelligence information with, and providing guidance to, other nations to disrupt the activities of criminal drug and migrant smuggling organizations and to interdict illegal drugs and migrants in source and transit countries. The USCG provides assistance to other nations to develop multimission maritime organizations. This assistance includes organizational management, resource development, training, and standardization of procedures and interoperability capabilities that enhance international cooperation. The DOD provides extensive detection and monitoring capabilities to facilitate interdiction operations involving U.S. agencies and their foreign counterparts.

To successfully reduce the supply of illegal drugs and the flow of illegal migrants into the United States, cooperative diplomatic efforts also will be needed. International law provides that, with few exceptions, boarding and searching a foreign vessel in international waters requires consent of the flag state. When vessels or aircraft are used for trafficking, they often move quickly from one national jurisdiction to another. Unless prior consent exists to stop, board, and search such vessels or aircraft, U.S. and other law enforcement authorities can easily be frustrated in their efforts to interdict traffickers crossing multiple jurisdictional lines.

The United States is party to 21 bilateral maritime counterdrug agreements, 12 international fisheries enforcement agreements, and 1 migrant repatriation agreement. Several additional agreements are under negotiation to provide a more effective web of cooperation.

To modernize its fleet, the USCG has initiated a Deepwater Capability Replacement Project [USDOT USCG 2000], a comprehensive approach to designing and obtaining its next fleet of ships, aircraft, and communications systems. Technology improvements also will be a key part of the battle against drugs. These include night vision goggles, forward-looking infrared systems, improved radar, faster boats, increased fixed-wing assets, and drug detection devices. The ability to monitor maritime activity covertly is an essential part of reducing the flow of illegal drugs and migrants and deterring unauthorized fishing.

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